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Claims

1. A method for the thermal treatment of granular solids in a fluidized bed (3, 3a) which is located in a fluidized-bed reactor (1, 1a), wherein microwave radiation is fed into the fluidized-bed reactor (1, 1a) through at least one wave guide (5), **characterized in that** the irradiation angle of the microwaves is inclined by an angle of 10° to 50°, in particular 10° to 20°, with respect to the principal axis (11) of the fluidized-bed reactor (1, 1a).
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- 10 2. The method as claimed in claim 1, **characterized in that** a gas stream is fed into the fluidized-bed reactor (1, 1a) through the same wave guide (5).
- 15 3. The method as claimed in claim 2, **characterized in that** the gas stream introduced through the wave guide (5) contains gases which react with the fluidized bed (3, 3a).
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4. The method as claimed in claim 2 or 3, **characterized in that** the gas stream introduced through the wave guide (5) is additionally utilized for a fluidization of the fluidized bed (3, 3a).
- 25 5. The method as claimed in any of claims 2 to 4, **characterized in that** heat is additionally supplied to the fluidized bed (3, 3a) by the introduced gas stream.
6. The method as claimed in any of claims 2 to 4, **characterized in that** the fluidized bed (3, 3a) is cooled by the introduced gas stream.
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7. The method as claimed in any of claims 2 to 6, **characterized in that** by means of the gas stream introduced into the wave guide (5) solid deposits are avoided in the wave guide (5).
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8. The method as claimed in any of the preceding claims, **characterized in** that the reactor comprises at least two fluidized-bed reactors (1, 1a), which are separated from each other by weirs or partitions (19, 21) such that solids can move as migrating fluidized-bed from one fluidized-bed reactor (1) into the adjacent fluidized-bed reactor (1a).

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9. The method as claimed in any of the preceding claims, **characterized in** that the microwave source (7) is combined with a secondary gassing (6) of a ring conduit and that the wave guide (5) is at the same time used for secondary gassing.

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10. The method as claimed in any of the preceding claims, **characterized in** that the used frequency of the microwave radiation is between 300 MHz and 30 GHz, preferably at the frequencies 435 MHz, 915 MHz and 2.45 GHz.

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11. The method as claimed in any of the preceding claims, **characterized in** that the temperatures in the fluidized bed (3, 3a) are between 150°C and 1200°C.

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12. The method as claimed in any of the preceding claims, **characterized in** that the Particle-Froude-Number Fr_p in the wave guide (5) is 0.1 to 100, preferably 2 to 30.

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13. A plant for the thermal treatment of granular solids in a fluidized bed (3, 3a), in particular for performing the method as claimed in any of claims 1 to 12, comprising a fluidized-bed reactor (1, 1a), a microwave source (7) disposed outside the fluidized-bed reactor (1, 1a) and a wave guide (5) for feeding the microwave radiation into the fluidized-bed reactor (1), **characterized in** that the wave guide (5) is inclined by an angle of 10° to 50°, in particular 10° to 20°, with 30 respect to the principal axis (11) of the fluidized-bed reactor (1, 1a).

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14. The plant as claimed in claim 13, **characterized in** that the wave guide (5) has a rectangular or round cross-section, whose dimensions are adjusted in particular to the used frequency of the microwave radiation.

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15. The plant as claimed in claim 13 or 14, **characterized in** that the wave guide (5) has a length of 0.1 m to 10 m.